

In the Claims

1. (Currently Amended) An apparatus ~~comprising~~comprising:  
a circuit being other than an oscillator that includes:  
a first portion which is coupled between first and second nodes and which includes a resonant tunneling device;  
a second portion which is coupled between said first and second nodes and which has an electrical reactance that includes at a selected frequency a complex conjugate reactance of a reactance of said resonant tunneling device at said selected frequency, so that at said selected frequency said complex conjugate reactance substantially cancels said reactance of said resonant tunneling device.
2. (Original) An apparatus according to Claim 1, wherein said resonant tunneling device is a resonant tunneling diode.
3. (Original) An apparatus according to Claim 1, wherein said first portion includes a further resonant tunneling device, said resonant tunneling devices being coupled in series with each other between said first and second nodes.
4. (Original) An apparatus according to Claim 1, wherein said selected frequency is greater than 100 GHz.
5. (Original) An apparatus according to Claim 1, wherein said second portion includes an inductor which is coupled between said first and second nodes, said complex conjugate reactance including an inductance of said inductor.
6. (Currently Amended) An apparatus according to Claim 5, wherein said second portion includes including a blocking capacitor, said inductor and said blocking capacitor being coupled in series with each other between said first and second nodes.
7. (Original) An apparatus according to Claim 1, wherein said second portion includes a transmission line having two conductors which are respectively coupled to said

first and second nodes, said complex conjugate reactance including an inductance of said transmission line.

8. (Original) An apparatus according to Claim 7, wherein said transmission line is an open line having an electrical length which is between one-quarter and one-half of the wavelength of said selected frequency.

9. (Original) An apparatus according to Claim 7, wherein said transmission line is a shorted line having an electrical length which is less than one-quarter of the wavelength of said selected frequency.

10. (Currently Amended) An apparatus according to Claim 9, wherein said second portion includes including first and second blocking capacitors which are each coupled between a respective terminal of said resonant tunneling device and a respective said conductor of said transmission line.

11. (Currently Amended) An apparatus according to Claim 1, wherein said second portion includes including a transformer having first and second coils, said second coil being coupled between said first and second nodes and being part of said second portion of said circuit, said complex conjugate reactance including an inductance of said second coil.

12. (Original) An apparatus according to Claim 1, wherein said second portion includes a plurality of components with respective impedances that collectively define said complex conjugate reactance, said plurality of components including at least one inductor and at least one capacitor.

13. (Original) An apparatus according to Claim 1, wherein said reactance of said resonant tunneling device includes an intrinsic capacitance and a terminal reactance of said resonant tunneling device.

14. (Original) An apparatus according to Claim 1, wherein said reactance of said resonant tunneling device includes an intrinsic capacitance of said resonant tunneling device but excludes a terminal reactance of said resonant tunneling device.

15. (Currently Amended) A method of operating a circuit other than an oscillator that includes a first portion which is coupled between first and second nodes and which includes a resonant tunneling device, and a second portion which is coupled between said first and second nodes, said method comprising:

causing said second portion to exhibit at a selected frequency an electrical reactance that includes a complex conjugate reactance of a reactance of said resonant tunneling device at said selected frequency, so that said complex conjugate reactance substantially cancels said reactance of said resonant tunneling device at said selected frequency.

16. (Original) A method according to Claim 15, including selecting a resonant tunneling diode to serve as said resonant tunneling device.

17. (Original) A method according to Claim 15, including selecting a frequency in excess of 100 GHz to be said selected frequency.

18. (Original) A method according to Claim 15, including configuring said second portion to have an inductor which is coupled between said first and second nodes, said complex conjugate reactance including an inductance of said inductor.

19. (Original) A method according to Claim 15, including configuring said second portion to have a transmission line with two conductors that are respectively coupled to said first and second nodes, said complex conjugate reactance including an inductance of said transmission line.

20. (Original) A method according to Claim 15, wherein said selecting of said reactance of said resonant tunneling device is carried out to include an intrinsic capacitance and a terminal reactance of said resonant tunneling device.

21. (Original) An apparatus according to Claim 15, wherein said selecting of said reactance of said resonant tunneling device is carried out to include an intrinsic capacitance of said resonant tunneling device and to exclude a terminal reactance of said resonant tunneling device.

22. (New) The apparatus of Claim 1, wherein the first portion and the second portion are part of a switch.

23. (New) The apparatus of Claim 1, wherein the first portion and the second portion are part of an amplifier.

24. (New) An apparatus comprising a circuit that includes:  
a first portion which is coupled between first and second nodes and which includes a resonant tunneling device;  
a second portion which is coupled between said first and second nodes and which has an electrical reactance that includes at a selected frequency a complex conjugate reactance of a reactance of said resonant tunneling device at said selected frequency, so that at said selected frequency said complex conjugate reactance substantially cancels said reactance of said resonant tunneling device; and  
a clock signal source having a frequency approximately the same as the selected frequency.

25. (New) An apparatus comprising:  
a circuit that includes:  
a first portion which is coupled between first and second nodes and which includes a resonant tunneling device;  
a second portion which is coupled between said first and second nodes and which has an electrical reactance that includes at a selected frequency a complex conjugate reactance of a reactance of said resonant tunneling device at said selected frequency, so that at said selected frequency said complex conjugate reactance substantially cancels said reactance of said resonant tunneling device; and  
an alternating current drive source for the circuit.

26. (New) The method of Claim 15, wherein the first portion and the second portion are part of a switch.

27. (New) The method of Claim 15, wherein the first portion and the second portion are part of an amplifier.

28. (New) The method of Claim 15, wherein the selected frequency is the frequency of a clock signal provided to the circuit.